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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,525	07/22/2003	Atsushi Sugahara	240250US2SRD CONT	5822
22850	7590	11/02/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			SHAPIRO, LEONID	
			ART UNIT	PAPER NUMBER
			2673	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/623,525

Applicant(s)

SUGAHARA ET AL.

Examiner

Leonid Shapiro

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 07.22.03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Otaka et al. (JP 03-174514).

As to claim 1, APA teaches an actuated film display device (See in Disclosure page 1, Lines 10-11) comprising:

a first fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22);

a first movable film electrode, which is placed to face the first fixed electrode to form a first optical path on an opposing side to the first fixed electrode, and which has a fixed end and a movable end, the movable electrode being displaced toward the first fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22) by application of a voltage not less than a first critical voltage between the first fixed electrode and the first movable film electrode, thereby shutting off the first optical pass (See in Disclosure Fig. 2C, page 11, Lines 14-23);

a second fixed electrode placed at a predetermined distance from the first fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22);

a second movable film electrode, which is placed to face the second fixed electrode to form a second optical path on an opposing side to the second fixed electrode, and which has a fixed end and a movable end, the movable end being displaced toward the second fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22) by application a voltage not less than a second potential difference different from the first potential difference between the second fixed electrode and the second movable film electrode, thereby shutting off the second optical path (See in Disclosure Fig. 2C, page 11, Lines 14-23),

a plurality of pixels, each of the plurality of pixels including a pair of the first fixed electrode and the first movable film electrode and a pair of the second fixed electrode and the second movable film electrode (See Figs. 5-6, items 132, 262, from Page 13, Line 5, to page 15, Line 18),

wherein the plurality of pixels provide gray scale display in accordance with a potential applied between the first electrode and the first movable film electrode and between the first electrode and the first movable film electrode (See Fig. 7, items 162, 165, Page 16, Lines 2-12)

APA does not teach the second critical voltage being different from the first critical voltage, and the first movable film electrode and the second film electrode being connected to a first signal line.

Otaka et al. teaches teach the second critical voltage being different from the first critical voltage (thresholds) (See Drawing 3, items V_e , V_a , from page 7, Line 15 to

page 8, Line 4), and the first electrode and the second film electrode being connected to a first signal line (in the reference the driving circuit simplified) (See Drawing 4, item 4).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate teaching of Otaka et al. in APA system in order to simplify the driving circuit (See Abstract in the Otaka et al. reference).

As to claim 11, Otaka et al. teaches subpixels connected to the same line (See Drawing 4, item 4).

As to claim 12, APA teaches an actuated film display device (See in Disclosure page 1, Lines 10-11) comprising:

a plurality of optical shutter sets arranged in row and columns, each of optical shutter sets comprising at least two optical shutter units (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22), at least two optical shutter units including a pair of a first fixed electrode and a movable film electrode and a pair of a second fixed electrode and a second movable film electrode, the first and second movable film electrodes being of a light-shield cantilever-type (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22);

a first movable film electrode, which is placed to face the first fixed electrode to form a first optical path on an opposing side to the first fixed electrode, and which has a fixed end and a movable end, the movable electrode being displaced toward the first fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22) by application of a voltage not less than a first critical voltage between the first

fixed electrode and the first movable film electrode, thereby shutting off the first optical pass (See in Disclosure Fig. 2C, page 11, Lines 14-23);

a second movable film electrode, which is placed to face the second fixed electrode to form a second optical path on an opposing side to the second fixed electrode, and which has a fixed end and a movable end, the movable end being displaced toward the second fixed electrode (See in Disclosure Fig. 6, items 162, 165, page 14, Lines 4-22) by application a voltage not less than a second potential difference different from the first potential difference between the second fixed electrode and the second movable film electrode, thereby shutting off the second optical path (See in Disclosure Fig. 2C, page 11, Lines 14-23),

a first driving circuit for supplying a driving signal to the optical shutter sets arranged in each of the rows (See Fig.5, item 152, page 13, Lines 5-18);

a second driving circuit for supplying a driving signal to the optical shutter sets arranged in each of the columns (See Fig.5, item 151, page 13, Lines 5-18);

the first driving circuit supplies a first potential to the fixed electrode of the optical shutter units in each of the rows (See Fig.5, item 152, page 13, Lines 5-18);

the second driving circuit supplies a second potential to the fixed electrode of the shutter units in each of the columns (See Fig.5, item 151, page 13, Lines 5-18),

wherein the optical shutter sets provide gray scale display in accordance with the first and second potentials applied to the shutter sets (See Fig. 7, items 162, 165, Page 16, Lines 2-12).

APA does not teach the second critical voltage being different from the first critical voltage, and the first movable film electrode and the second film electrode being connected to a first signal line.

Otaka et al. teaches teach the second critical voltage being different from the first critical voltage (thresholds) (See Drawing 3, items Ve, Va, from page 7, Line 15 to page 8, Line 4), and the first electrode and the second film electrode being connected to a first signal line (in the reference the driving circuit simplified) (See Drawing 4, item 4).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate teaching of Otaka et al. in APA system in order to simplify the driving circuit (See Abstract in the Otaka et al. reference).

2. Claim 2-10 and 13-17 rejected under 35 U.S.C. 103(a) as being unpatentable over APA and Otaka et al. as applied to claims 1, 12 above, and further in view of Lewiner et al. (US Patent No. 4, 194,189).

As to claims 2-4, 13-15, Lewiner et al does not show the actuated film display device with a distance between the fixed and movable ends differs for the first and second electrodes, and thickness differs for first and second movable film electrode, and a distance between the first fixed electrode and the fixed end of the first movable film electrode differs from a distance between the second fixed electrode and the fixed end of the second movable film electrode. But, Lewiner et al teaches about "...different shapes..." (See Fig. 4, items 21, 22, in description See Col. 8, Lines 4-9).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

As to claims 5, 8, APA and Otaka et al. do not show a plurality of pixels, each of the plurality of pixels including a pair of the first fixed electrode and the first movable film electrode and a pair of the second fixed electrode and the second movable film electrode so as to form a light guiding portion therebetween.

Lewiner et al teaches a plurality of pixels, each of the plurality of pixels including a pair of the first fixed electrode and the first movable film electrode and a pair of the second fixed electrode and the second movable film electrode so as to form a light guiding portion therebetween. (See Fig. 14, items 125a, 126a, 125b, 126b, 124a, 124b, in description See Col.12, Lines 43-64).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

As to claims 6, 16, APA and Otaka et al. do not show the first and the second fixed electrode comprises a light guiding portion which is formed of a transparent material and has a curved surface which faces a corresponding one of the first and second movable film electrode, and an electrode formed of a transparent conductive layer and formed on the curved surface.

Lewiner et al teaches the first and the second fixed electrode comprises a light guiding portion which is formed of a transparent material and has a curved surface which faces a corresponding one of the first and second movable film electrode, and an electrode formed of a transparent conductive layer and formed on the curved surface (See Fig. 13-16, items 125, 126, 172, 171, in description See Col 12, Lines 8-65).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

As to claims 7, 9, APA and Otaka et al. do not show an insulating layer covering conductive layer.

Lewiner et al. teaches an insulating layer covering conductive layer (See Fig. 13, items 121, 128, 129, in description See Col. 12, Lines15-20).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

As to claim 10, APA and Otaka et al. do not show teaches a light source arranged at a side of the fixed ends of the movable film electrode.

Lewiner et al. teaches a light source arranged at a side of the fixed ends of the movable film electrode (See Fig. 16, item 173, in description See Col. 13, Lines 40-47).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

As to claim 17, APA and Otaka et al. do not show teaches the fixed electrode is a plate-form electrode and faces the movable film electrode so as form a light guiding portion between the movable film electrode and the fixed electrode.

Lewiner et al teaches the fixed electrode is a plate-form electrode and faces the movable film electrode so as form a light guiding portion between the movable film electrode and the fixed electrode. (See Fig. 13, items 124, 125, 126, in description See Col. 12, Lines 8-28).

It have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the teaching of Lewiner et al. into APA and Otaka et al. system in order to control different critical voltages and obtain gray scale (See Col. 1, Lines 40-46 in Lewiner et al. reference).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

The Florence et al. (US Patent No. 5,606,441) reference disclosed multiple phase light modulation using binary addressing.

The Sarma (US Patent No. 5,191,452) reference disclosed active matrix LCD fabrication for gray scale.

The Bernot et al. (US Patent No. 4,480,460) reference disclosed apparatus and method for providing a gray scale capability in LCD unit.


Telephone inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 703-305-5661. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ls 10.07.04



**VIJAY SHANKAR
PRIMARY EXAMINER**